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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/746,114	12/22/2000	Akihiko Okamoto	14185	2234
23389	7590	01/21/2004		
SCULLY SCOTT MURPHY & PRESSER, PC 400 GARDEN CITY PLAZA GARDEN CITY, NY 11530			EXAMINER SANTIAGO, MARICELI	
			ART UNIT 2879	PAPER NUMBER

DATE MAILED: 01/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/746,114

Applicant(s)

OKAMOTO ET AL.

Examiner

Mariceli Santiago

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 28-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10, 11, 13 and 14 is/are allowed.
- 6) ☒ Claim(s) 1-9, 12 and 28-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

The Amendment, filed on September 22, 2003, has been entered and acknowledged by the Examiner.

Cancellation of claims 15-27 has been entered.

Claim Objections

Claims 28 and 29 are objected to because of the following informalities:

Claim 28 recites the limitation "kinds of atomic", the recitation appears to be out of context . Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-9, 12 and 28-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Kurokawa et al. (WO99/66523, for rejection purposes see English equivalent US 6,645,402).

Regarding claims 1, 4, 6-9, Kurokawa discloses a fabrication method of a nano-tube comprising the steps of placing the nano-tube on a glass substrate, heating the nano-tube at a temperature of from 300° to 800°C, a temperature lower than a distortion point of the glass substrate, delivering ions of relatively low mass and an atomic state of atoms possessing sufficient energy, onto the nano-tubes in order to produce dangling bonds along the nano-tube surface and oxidizing the nano-tube, simultaneously (Column 12, lines 1-39).

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Regarding claim 2, Kurokawa discloses a fabrication method of a nano-tube wherein, in the ion radiating step, after an element is ionized, the resultant ions are accelerated by an electric field and thereby radiated onto the nano-tube (Column 12, lines 1-39).

Regarding claim 3, Kurokawa discloses a fabrication method of nano-tube wherein an element had been reduced into plasma condition and the ions that have been produced in the plasma condition creating process are radiated onto the nano-tube (Column 12, lines 1-39).

Regarding claim 5, Kurokawa discloses a fabrication method of a nano-tube comprising the step of heating the nano-tube at a temperature of from 300° to 800°, and radiating an atomic state of atoms and ions onto the nano-tube thus-heated, simultaneously (Column 12, lines 1-39).

Regarding claim 12, Kurokawa discloses a fabrication method wherein the nano-tube is a carbon nano-tube (Column 12, lines 1-39).

Regarding claims 28 and 29, Kurokawa discloses a fabrication method wherein in the delivering step, the ion is selected from a group of kinds of atomic consisting hydrogen, nitrogen and argon (Column 12, lines 1-39).

Regarding claim 30, Kurokawa discloses a fabrication method of a nano-tube, a substrate on which a nano-tube is formed and is exposed in a plasma atmosphere (Column 12, lines 1-39).

Response to Arguments

Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

Claims 10-11, 13 and 14 are allowed over the prior art of record.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 10, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 10, and specifically comprising the steps of radiating ions onto the nano-tube, heating the nano-tube at a temperature of from 300°C to 800°C, radiating ions and an atomic state of atoms onto the nano-tube thus heated

Regarding claim 11, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 11, and specifically comprising the steps of radiating ions onto the nano-tube, heating the nano-tube at a temperature of from 300°C to 800°C, radiating ions and an atomic state of atoms onto the nano-tube thus heated, simultaneously.

Regarding claim 13, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 14, and specifically the steps of introducing a gas onto the emitter, applying a voltage to one of the gate electrode, the anode electrode, and a newly provided electrode to thereby cause an emission of the electrons, ionizing the gas, and delivering ions of relatively low mass and sufficient energy onto the nano-tube thus-heated in order to produce dangling bonds along the nano-tube surface.

Regarding claim 14, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 14, and specifically the steps of introducing a gas onto the emitter, applying a voltage to one of the gate electrode, the anode electrode, and a newly provided electrode to thereby cause an emission of the electrons, ionizing the gas, radiating ions onto the nano-tubes, and oxidizing the nano-tubes.

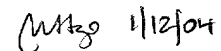
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Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mariceli Santiago whose telephone number is (571) 272-2464. The examiner can normally be reached on Monday-Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


Mariceli Santiago
Patent Examiner
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